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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/645,617	08/22/2003	Osamu Shimamura	50195-379	8268

7590 06/14/2006

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EXAMINER	
LEWIS, BEN	

ART UNIT	PAPER NUMBER
1745	

DATE MAILED: 06/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/645,617	SHIMAMURA ET AL.	
	Examiner	Art Unit	
	Ben Lewis	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4/7/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 4, 5 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Hayama et a. (U.S. Patent No. 6,225,778 B1).

With respect to claims 1 and 9, Hayama et al disclose a battery pack wherein according to the present invention, there is provided a battery pack which comprises a flat battery cell including a flat electric power generating element, at least one armor material for sealing the flat electric power generating element, and a positive tab and a negative tab extending from the electric power generating element to the outside of the armor material through sealings of the armor material; a circuit board connected to the positive tab and the negative tab; and a container having two main walls extending along two main surfaces of the flat battery cell (Col 4 lines 33-50).

Regarding a laminate film formed by combining polymer and metal with each other, Hayama et al teach that the battery pack 20 of FIG. 7, the upper case (first case half) is not limited to that made of resin, but may be made, for example, of metal. With the upper case made of metal, a metal plate may be pressed to fabricate the first case half. Alternatively, the first case half may be cast by injection molding or the like. Metal materials used for the first case half may include aluminum, stainless steel, aluminum

alloy, magnesium alloy, cold rolled steel plate, hot rolled steel plate, plated steel plate, and so on. Then, as a metal plate used for the second case half, similar metal plates to those mentioned above may be used. It should be noted that in the battery pack 20, when the first case half is made of metal, the second case half for use in combination with this must be such one that is composed of a metal plate and a resin frame attached integral with the metal plate. Alternatively, when the first case half is made of resin, the second case half may be formed only of a metal plate as is the case of FIGS. 12, 15 and 18. Resin materials suitably used for the first case half and the frame of the battery pack 20 may be thermoplastic resin materials. For example, thermoplastic resin materials such as polycarbonate, liquid crystal polymer, a compound of polycarbonate and acrylic butadiene styrene rubber, polypropylene, polybutylene terephthalate, polyphenylene sulfide, and so on may be used (Col 18 lines 59-67); (Col 19 lines 1-16).

Regarding a power generating element formed of a plurality of electrode plates and separators, Hayama et al. teach that although the first to fifteenth embodiments each comprise a film type flat battery cell including an electric power generating element comprised of positive and negative electrodes and an electrolyte disposed therebetween, a film type flat battery cell of this invention may include, for example, an electric power generating element obtained by forming a spiral laminator into a flat shape. The spiral laminator is obtained by spirally wounding a laminator comprised of positive and negative electrodes and a separator interposed therebetween (Col 29 lines 29-40).

Regarding electrode terminal lead coupled to the electrode plate, Hayama et al teach that, a terminal base 6i having a protrusion 6h formed on the top surface and shaped complementary to the recess 6g, and ;eads 6c formed on the bottom surface is positioned below the sealing 4A.sub.4. Next, the circuit board 6 and the terminal base 6i are pressed into contact to sandwich the positive and negative tabs 1a, 2a between the protrusion 6h and the recessed terminals 6g to form electric connection between the flat battery cell B.sub.1 and the circuit board 6. Subsequently, the lower case 34 having windows 34d at locations corresponding to the leads 6c is prepared and attached to the upper case 32 to complete the battery pack 30 (Col 16 lines 45-58).

Regarding forming a thermally welded portion on an outer periphery of the laminate film, Hayama et al teach that the electric power generating element A is wrapped by two sheets of armor materials 4, for example, Al laminate films, where peripheral portions of the armor materials 4 are thermally fused. In FIG. 22, reference numerals $4A_1$, 4_2, $4A_3$, $4A_4$ designate four sealings of the armor materials 4 (Col 1 lines 41-50).

Regarding wherein a through-hole is provided in a position thereof contacting the thermally welded portion, Hayama et al teach that the terminal set A11 comprises a resin molding 203 entirely made of an electrically insulating resin and having three insertion holes 203a in the shape of quadrangle; and terminals 203b made, for example, of copper, and molded in the molding 203 such that they are exposed within the insertion holes 203a “through holes” for connection with predetermined terminals (not shown) of the circuit boards 201B (Col 25 lines 7-14) (See Fig 48).

With respect to claim 4, Hayama et al teach that the connection of the lands with the positive and negative tabs can be made for example by ultrasonic welding. Alternatively, the lands and the tabs may be adhered with an electrically conductive adhesive coated on connection surfaces thereof Col 15 lines 63-67).

With respect to claims 2 and 5, Hayama et al teach a battery pack 200 illustrated in FIG. 25 contains the flat battery cell B_1 or B_2 within a resin-made container 100 which has a divided structure consisting of an upper case 100a and a lower case 100b. For fabricating the battery pack 200, the flat battery cell is disposed in the lower case 100b with the sealings $4A_1$,"through hole" $4A_2$, $4A_3$ bent upward or downward,

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hayama et a. (U.S. Patent No. 6,225,778 B1) as applied to claims 1, 2, 4, 5 and 9 above.

With respect to claim 3, Hayama et al disclose a battery pack in paragraph 2 above. Hayama et al do not specifically teach wherein a ration of a cross-sectional area of the through-holes to a cross-sectional area of the electrode terminal lead ranges from 20-50%. However, it would have been obvious to one of ordinary skill in the art to adjust the cross-sectional area of the electrode terminal lead to arrive at the claimed ratio 20-50% between the through-holes and the terminal lead because terminal leads and battery sealing material may be of various thickness.

5. Claims 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hayama et a. (U.S. Patent No. 6,225,778 B1) and further in view of Dasgupta et al. (U.S. Patent No. 6,080,508).

With respect to claim 6, Hayama et al disclose a battery pack wherein according to the present invention, there is provided a battery pack which comprises a flat battery cell including a flat electric power generating element, at least one armor material for sealing the flat electric power generating element, and a positive tab and a negative tab extending from the electric power generating element to the outside of the armor material through sealings of the armor material; a circuit board connected to the positive tab and the negative tab; and a container having two main walls extending along two main surfaces of the flat battery cell (Col 4 lines 33-50).

Regarding a laminate film formed by combining polymer and metal with each other, Hayama et al teach that the battery pack 20 of FIG. 7, the upper case (first case half) is not limited to that made of resin, but may be made, for example, of metal. With the upper case made of metal, a metal plate may be pressed to fabricate the first case half. Alternatively, the first case half may be cast by injection molding or the like. Metal materials used for the first case half may include aluminum, stainless steel, aluminum alloy, magnesium alloy, cold rolled steel plate, hot rolled steel plate, plated steel plate, and so on. Then, as a metal plate used for the second case half, similar metal plates to those mentioned above may be used. It should be noted that in the battery pack 20, when the first case half is made of metal, the second case half for use in combination with this must be such one that is composed of a metal plate and a resin frame attached integral with the metal plate. Alternatively, when the first case half is made of resin, the second case half may be formed only of a metal plate as is the case of FIGS. 12, 15 and 18. Resin materials suitably used for the first case half and the frame of the battery pack 20 may be thermoplastic resin materials. For example, thermoplastic resin materials such as polycarbonate, liquid crystal polymer, a compound of polycarbonate and acrylic butadiene styrene rubber, polypropylene, polybutylene terephthalate, polyphenylene sulfide, and so on may be used (Col 18 lines 59-67); (Col 19 lines 1-16).

Regarding a power generating element formed of a plurality of electrode plates and separators, Hayama et al. teach that although the first to fifteenth embodiments each comprise a film type flat battery cell including an electric power generating element comprised of positive and negative electrodes and an electrolyte disposed

therebetween, a film type flat battery cell of this invention may include, for example, an electric power generating element obtained by forming a spiral laminator into a flat shape. The spiral laminator is obtained by spirally wounding a laminator comprised of positive and negative electrodes and a separator interposed therebetween (Col 29 lines 29-40).

Regarding electrode terminal lead coupled to the electrode plate, Hayama et al teach that, a terminal base 6i having a protrusion 6h formed on the top surface and shaped complementary to the recess 6g, and ;eads 6c formed on the bottom surface is positioned below the sealing 4A.sub.4. Next, the circuit board 6 and the terminal base 6i are pressed into contact to sandwich the positive and negative tabs 1a, 2a between the protrusion 6h and the recessed terminals 6g to form electric connection between the flat battery cell B.sub.1 and the circuit board 6. Subsequently, the lower case 34 having windows 34d at locations corresponding to the leads 6c is prepared and attached to the upper case 32 to complete the battery pack 30 (Col 16 lines 45-58).

Regarding forming a thermally welded portion on an outer periphery of the laminate film, Hayama et al teach that the electric power generating element A is wrapped by two sheets of armor materials 4, for example, Al laminate films, where peripheral portions of the armor materials 4 are thermally fused. In FIG. 22, reference numerals $4A_1$, 4_2, $4A_3$, $4A_4$ designate four sealings of the armor materials 4 (Col 1 lines 41-50).

Regarding wherein a through-hole is provided in a position thereof contacting the thermally welded portion, Hayama et al teach that the terminal set A11 comprises a

resin molding 203 entirely made of an electrically insulating resin and having three insertion holes 203a in the shape of quadrangle; and terminals 203b made, for example, of copper, and molded in the molding 203 such that they are exposed within the insertion holes 203a "through holes" for connection with predetermined terminals (not shown) of the circuit boards 201B (Col 25 lines 7-14) (See Fig 48).

Hayama et al do not specifically teach at least two laminate packaging flat cells connected in series and/or parallel. However Dasgupta et al disclose packaging assembly for a lithium battery wherein such batteries are commonly made up of several lithium battery cells connected in parallel or in series, or located between a pair of single current collector sheets with electrodes mounted on the collectors in parallel arrangement and the array of cells folded to make a single battery having only two electrical terminals (Col 7 lines 35-50). Therefore it would have been obvious to one of ordinary skill in the art to incorporate the parallel or series arrangement of Dasgupta et al of the batteries of Hayama et al because Dasgupta et al teach that such batteries are commonly made up of several lithium battery cells connected in parallel or in series, or located between a pair of single current collector sheets with electrodes mounted on the collectors in parallel arrangement and the array of cells folded to make a single battery having only two electrical terminals (Col 7 lines 35-50).

6. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayama et a. (U.S. Patent No. 6,225,778 B1) and further in view of Haba (U.S. Patent No. 6,465,986 B1).

With respect to claims 7 and 8, Hayama et al disclose a battery pack wherein according to the present invention, there is provided a battery pack which comprises a flat battery cell including a flat electric power generating element, at least one armor material for sealing the flat electric power generating element, and a positive tab and a negative tab extending from the electric power generating element to the outside of the armor material through sealings of the armor material; a circuit board connected to the positive tab and the negative tab; and a container having two main walls extending along two main surfaces of the flat battery cell (Col 4 lines 33-50).

Regarding a laminate film formed by combining polymer and metal with each other, Hayama et al teach that the battery pack 20 of FIG. 7, the upper case (first case half) is not limited to that made of resin, but may be made, for example, of metal. With the upper case made of metal, a metal plate may be pressed to fabricate the first case half. Alternatively, the first case half may be cast by injection molding or the like. Metal materials used for the first case half may include aluminum, stainless steel, aluminum alloy, magnesium alloy, cold rolled steel plate, hot rolled steel plate, plated steel plate, and so on. Then, as a metal plate used for the second case half, similar metal plates to those mentioned above may be used. It should be noted that in the battery pack 20, when the first case half is made of metal, the second case half for use in combination with this must be such one that is composed of a metal plate and a resin frame attached

integral with the metal plate. Alternatively, when the first case half is made of resin, the second case half may be formed only of a metal plate as is the case of FIGS. 12, 15 and 18. Resin materials suitably used for the first case half and the frame of the battery pack 20 may be thermoplastic resin materials. For example, thermoplastic resin materials such as polycarbonate, liquid crystal polymer, a compound of polycarbonate and acrylic butadiene styrene rubber, polypropylene, polybutylene terephthalate, polyphenylene sulfide, and so on may be used (Col 18 lines 59-67); (Col 19 lines 1-16).

Regarding a power generating element formed of a plurality of electrode plates and separators, Hayama et al. teach that although the first to fifteenth embodiments each comprise a film type flat battery cell including an electric power generating element comprised of positive and negative electrodes and an electrolyte disposed therebetween, a film type flat battery cell of this invention may include, for example, an electric power generating element obtained by forming a spiral laminator into a flat shape. The spiral laminator is obtained by spirally wounding a laminator comprised of positive and negative electrodes and a separator interposed therebetween (Col 29 lines 29-40).

Regarding electrode terminal lead coupled to the electrode plate, Hayama et al teach that, a terminal base 6i having a protrusion 6h formed on the top surface and shaped complementary to the recess 6g, and ;eads 6c formed on the bottom surface is positioned below the sealing 4A.sub.4. Next, the circuit board 6 and the terminal base 6i are pressed into contact to sandwich the positive and negative tabs 1a, 2a between the protrusion 6h and the recessed terminals 6g to form electric connection between the

flat battery cell B.sub.1 and the circuit board 6. Subsequently, the lower case 34 having windows 34d at locations corresponding to the leads 6c is prepared and attached to the upper case 32 to complete the battery pack 30 (Col 16 lines 45-58).

Regarding forming a thermally welded portion on an outer periphery of the laminate film, Hayama et al teach that the electric power generating element A is wrapped by two sheets of armor materials 4, for example, Al laminate films, where peripheral portions of the armor materials 4 are thermally fused. In FIG. 22, reference numerals $4A_1$, 4_2, $4A_3$, $4A_4$ designate four sealings of the armor materials 4 (Col 1 lines 41-50).

Regarding wherein a through-hole is provided in a position thereof contacting the thermally welded portion, Hayama et al teach that the terminal set A11 comprises a resin molding 203 entirely made of an electrically insulating resin and having three insertion holes 203a in the shape of quadrangle; and terminals 203b made, for example, of copper, and molded in the molding 203 such that they are exposed within the insertion holes 203a "through holes" for connection with predetermined terminals (not shown) of the circuit boards 201B (Col 25 lines 7-14) (See Fig 48).

Hayama et al do not specifically teach at least two battery modules connected in series and/or parallel. However Haba disclose a battery network with compounded interconnections wherein The EV1, for example, includes a battery pack consisting of 26 Valve-Regulated Lead Acid (VRLA) modules electrically connected together in a single series string for an available voltage of 312 Volts and a storage capacity of about 16.3 kW (Col 1 lines 25-40).

Therefore it would have been obvious to one of ordinary skill in the art to incorporate the parallel or series arrangement of battery modules of Haba of the batteries of Hayama et al because Haba et al teach that although the described embodiment of the battery operating system is a 120V, 48A battery pack, it should be realized that the battery pack may alternatively be configured, within the scope of this invention, to have different ratings and/or capacity. For example, lithium-ion or lithium-ion solid polymer batteries with different ratings may be used for savings in weight and size and increase in energy (Col 5 lines 31-52).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben Lewis whose telephone number is 571-272-6481. The examiner can normally be reached on 8:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ben Lewis

PATRICK JOSEPH RYAN
SUPERVISORY PATENT EXAMINER

Patent Examiner
Art Unit 1745